REMARKS

Claims 1-18 were pending in this application prior to this paper.

A Request for Continued Examination is submitted together with this paper.

In this paper, the Applicant has:

- amended claims 1-4, 6-14, 16 and 17; and
- added new claims 19 and 20.

These amendments and new claims are submitted to be completely supported by the application as originally filed and to add no new matter.

Formalities

The Office Action has raised a number of informalities with claims 12, 14, 16 and 17. The Applicant has amended:

- claims 12 and 17 to replace "a third data frame from the address" with --a third data frame from the non-VLAN-aware network element--; and
- claims 14 and 16 to replace "a second data frame from a second address" with --a second data frame from a second network element having a second address--.

The Applicant submits that these amendments obviate the informalities objections raised in the Office Action.

Claims 1-4, 8-12 and 14-18

The Examiner has raised the combination of US patent No. 6,111,874 (Kerstein) and US patent publication No. 2005/0083949 (Dobbins et al.) in connection with claims 1-4, 8-12 and 14-18. The Applicant submits that claims 1-4, 8-12 and 14-18 (as amended) patentably distinguish the combination of Kerstein and Dobbins et al.

The Office Action expresses the view that Kerstein discloses a number of the claim 1 features. As understood, Kerstein discloses a network switch configured for switching data packets across multiple ports. The Kerstein switch uses an address table to generate frame forwarding information. A decision-making engine determines (from a received data

frame) a source address, a destination address, a receive port number and, if applicable, a VLAN ID. The decision making engine then searches the table twice to generate frame forwarding information. The first search is based on a combination of the source address (read from the data frame) and the receive port number (i.e. the number of the port on which the data frame was received) and returns a VLAN index. The second search is based on the combination of the destination address (read from the data frame) and the VLAN index and returns a port vector indicating the port(s) of the switch to which the data frame should be forwarded.

Claim 1 (as amended) recites "providing a bridge device having a plurality of ports and a shared forwarding database, the plurality of ports comprising a local interface port for connecting the bridge to a plurality of end devices operating on different virtual local area networks (VLANs)". This claim 1 feature indicates that there is a single local interface port connecting the bridge to a plurality of end devices. Kerstein fails to disclose this claim 1 feature. In direct contrast to this claim 1 feature, the Kerstein switch (12) has a separate port associated with each network device connected to the switch. More particularly, Kerstein teaches "multiport switch 12 includes twenty-four (24) 10 Mb/s media access control (MAC) ports 60 for sending and receiving data packets in half-duplex between the respective 10 Mb/s network stations 14 (ports 1-24) and two 100 Mb/s MAC ports 62 for sending and receiving data packets in full-duplex between the respective 100 Mb/s network stations 16 (ports 25, 26)" - see col. 5, ln. 25-33.

Dobbins et al. fail to remedy this deficiency. The Dobbins et al. network 10 is shown in Figure 1 and described at paragraph [0099]. Dobbins et al. teach that network 10 has a number of switches 11-14 connected in a mesh topology by links 15 and a number of end systems 20-31 which "extend from access ports on various switches". Figure 1 of Dobbins et al. explicitly shows that end systems 20-31 are each connected separately to their respective VLAN switches 11-14. Accordingly, Dobbins et al. also fail to disclose the claim 1 feature of "providing a bridge device having a plurality of ports and a shared forwarding database, the plurality of ports comprising a local interface port for connecting the bridge to a plurality of end devices operating on different virtual local area networks (VLANs)".

Claim 1 (as amended) also recites "creating an entry in a shared forwarding database, the entry indexed exclusively by an address of a non-VLAN-aware network element connected to the connection-based network". Kerstein fails to disclose or suggest this claim 1 feature. Kerstein clearly discloses performing a pair of searches on its switching table - see col. 8, ln. 50-57. The first search is based on a combination of the source address (read from a received data frame) and the receive port number of the data frame. The second search is based on a combination of the destination address (read from the data frame) and the VLAN index. Accordingly, the Kerstein switching table is indexed by source/destination addresses in combination with other indexing criteria (i.e. the receive port number and the VLAN index). The architecture of the Kerstein switching table permits multiple entries for a given address and these entries are only discerned from one another using the other indexing criteria. It cannot be said that the Kerstein switching table contains "an entry ... indexed exclusively by an address of a non-VLAN-aware network element connected to the connection-based network" as recited in claim 1.

Dobbins et al. fail to remedy this deficiency. In direct contrast, the switching tables disclosed by Dobbins et al. have entries corresponding to connections which are indexed "based on the source-destination MAC address pair" (see paragraph [0195], ln. 5-7). The Dobbins et al. switching tables are indexed by a pair of MAC addresses. Dobbins et al. describe the importance of this aspect of their system in paragraph [0036], "unlike switches that forward or filter based only on the destination MAC address, the switches of the present invention use the source and destination MAC address ... This is particularly useful in client/server models ...". Accordingly, Dobbins et al. also fail to disclose "an entry ... indexed exclusively by an address of a non-VLAN-aware network element connected to the connection-based network" as recited in claim 1.

The Examiner correctly points out (on page 3 of the Office Action) that Kerstein does not disclose a number of the claim 1 features including:

- the entry indicating that data addressed to the address should be source routed - now amended to recite "the entry indicating that data addressed to the non-VLAN-aware network element should be source routed";
- determining that the data frame requires source routing based on the entry in the shared forwarding database; and

- identifying a port based at least in part on the source routing data - now amended to recite "identifying one of the remote interface ports associated with one of the end devices, based at least in part on the source routing data".

The Office Action expresses the view that Dobbins et al. disclose these claim 1 features. The Applicant respectfully submits that Dobbins et al. also fail to disclose these claim 1 features.

Claim 1 (as amended) recites "the entry indicating that data addressed to the non-VLAN-aware network element should be source routed". Dobbins et al. fail to disclose any network elements which are "non-VLAN-aware". As discussed above, the Dobbins et al. network 10 is shown in Figure 1 and described at paragraph [0099]. Each of the Dobbins et al. switches 11-14 is referred to in Figure 1 as a "VLAN switch" and is therefore VLAN aware. Each of the Dobbins et al. end systems 20-31 shown in Figure 1 is color/hatch coded to distinguish the VLAN to which it belongs. All of the Dobbins et al. network elements are VLAN-aware. Accordingly, Dobbins et al. fail to teach or suggest the claim 1 feature of "the entry indicating that data addressed to the non-VLAN-aware network element should be source routed".

Claim 1 (as amended) recites the combination of "an entry in the shared forwarding database, the entry indexed exclusively by an address of a non-VLAN-aware network element connected to the connection-based network and the entry indicating that data addressed to the non-VLAN-aware network element should be source routed" and "determining that the data frame requires source routing based on the entry in the shared forwarding database". Dobbins et al. fail to disclose table entries in the call-originating switch (or any of the other switches) having these claim 1 features. The Dobbins et al. call-originating switch initiates the connection management process and sends a "source-routed connect message" whenever it determines that it has received a data frame for which there is no active connection (i.e. its switching table contains no entry corresponding to the source/destination MAC address pair of the data frame) - (see paragraph [0035], ln. 1-5). The purpose of the Dobbins et al. connection management system is to establish entries in the switching tables for each of the switches in the connection (i.e. on the path) between the source MAC address and the destination MAC address - see paragraphs [0035]-[0038] and

[0172]-[0198]. Dobbins et al. fail to disclose or suggest that the lack of an active connection (i.e. the initiation of a source-routed connect message) is "indicated" or "determined" by an entry in a shared database as recited in claim 1. In direct contrast to these claim 1 features, the lack of an active connection is indicated/determined in the Dobbins et al. system by a corresponding lack of an entry in the switching table of the call-originating switch.

Furthermore, as discussed above, claim 1 recites that the shared forwarding database entry is "indexed exclusively by an address of a non-VLAN-aware network element connected to the connection-based network". In contrast, the switching tables disclosed by Dobbins et al. have entries corresponding to connections which are indexed "based on the source-destination MAC address pair" (see paragraph [0195], ln. 5-7).

In addition, the Applicant respectfully submits that it would not be obvious to combine the features of the Kerstein system with the features of the Dobbins et al. system in the manner contemplated by the Office Action. More particularly, it would be redundant to include additional information in the entries of the Kerstein switching tables to indicate or determine that particular data frames should be source routed. Routing information (i.e. port vectors) are already contained in the Kerstein database for various combinations of source address, destination address and VLAN index (see col. 8, ln. 44 - col. 10, ln. 18). Further, the Kerstein switch is specifically configured to know which ports are tagged (i.e. with VLAN tags) and which ports are untagged. The logic functions of the Kerstein switch are performed differently for data frames received from tagged and untagged ports (see col. 8, ln. 11-17). Accordingly, the port on which a data frame is received at the Kerstein switch determines the manner in which the data frame is handled. That is, the port on which a data frame is received in the Kerstein switch determines whether there is an attempt to read a VLAN tag from the data frame. The VLAN tag is alleged by the Examiner to be the claim 1 "source routing data" (see page 3 of the Office Action). Since the receive port on which data is received determines whether the Kerstein switch reads the VLAN tag, it would be redundant to include an additional entry in the Kerstein database to indicate or determine that particular data frames should be source routed and that source routing data should be read from such source routed data frames.

Based on each and all of the reasons presented above, the Applicant submits that claim 1 patentably distinguishes the combination of Kerstein and Dobbins et al. Claims 2-4, 8-12 and 14-18 depend from claim 1 and are submitted to patentably distinguish the combination of Kerstein and Dobbins et al. for at least this reason.

Claim 13

The Office Action has raised the combination of Kerstein and Dobbins et al. in connection with claim 13. The Applicant submits that claim 13 (as amended) patentably distinguishes the combination of Kerstein and Dobbins et al.

Claim 13 (as amended) recites a bridge device with "a plurality of bridge ports comprising a local interface port connected to a plurality of end devices operating on different virtual local area networks (VLANs)". As discussed above in relation to claim 1, neither Kerstein nor Dobbins et al., alone or in combination, disclose a single local interface port connected to a plurality of end devices operating on different virtual local area networks.

Claim 13 (as amended) recites "a shared forwarding database, the shared forwarding database indexed exclusively by a single address field". As discussed above, the switching tables disclosed by both Kerstein and Dobbins et al. are indexed by multiple fields. More particularly, the Kerstein switching tables are indexed by the combination of source address and receive port number (search #1) or the combination of destination address and VLAN index (search #2) and the Dobbins et al. switching tables are indexed by the combination of source and destination MAC addresses. Neither Kerstein nor Dobbins et al., alone or in combination, disclose the claim 13 features of a shared forwarding database "indexed exclusively by a single address field".

The Examiner correctly points out (on page 8 of the Office Action) that Kerstein fails to disclose the claim 13 features of:

- at least one second record associating a corresponding second address with information indicating that data sent to the corresponding second address requires source routing - now amended to recite "at least one second record associating a corresponding second address with information indicating that data sent to the

corresponding second address requires source routing, the corresponding second address being the address of the non-VLAN aware network element"; and

- determining from the at least one second record that the data frame requires source routing.

The Office Action expresses the view that Dobbins et al. disclose these claim 13 features. The Applicant respectfully submits that Dobbins et al. also fail to disclose these claim 13 features.

Claim 13 (as amended) recites "at least one second record associating a corresponding second address with information indicating that data sent to the corresponding second address requires source routing, the corresponding second address being the address of the non-VLAN aware network element". As discussed above in relation to claim 1, Dobbins et al. does not disclose that any of the devices in network 10 are non-VLAN aware. Accordingly, Dobbins et al. fail to teach or suggest the claim 13 feature of a database record which indicates that data sent to the address of a non-VLAN-aware device requires source routing.

Claim 13 recites the combination of "a shared forwarding database ... indexed exclusively by a single address field and ... comprising ... at least one second record associating a corresponding second address with information indicating that data sent to the corresponding second address requires source routing, the corresponding second address being the address of the non-VLAN-aware network element" and "determining from the at least one second record that the data frame requires source routing". As discussed above, the Dobbins et al. system initiates the connection management process and sends a "source-routed connect message" when a call-originating switch receives a data frame for which there is no established connection information. The lack of established connection information in the Dobbins et al. system corresponds to a situation where there is no entry in the switching table of the call-originating switch corresponding to the source/destination MAC address pair of the received data frame. This contrasts directly, with the features of claim 13 which recite that the bridge is configured for "determining from the at least one second record that the data frame requires source routing."

Based on the reasoning presented above, the Applicant submits that claim 13 patentably distinguishes the combination of Kerstein and Dobbins et al.

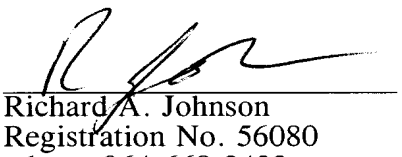
New claims 19, 20

The Applicant has added new claims 19 and 20 which are submitted to further distinguish the prior art of record.

Conclusions

The Applicant submits that the foregoing amendments place this application in condition for allowance. Reconsideration and allowance of this application is therefore respectfully requested.

Respectfully submitted,

By: 

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